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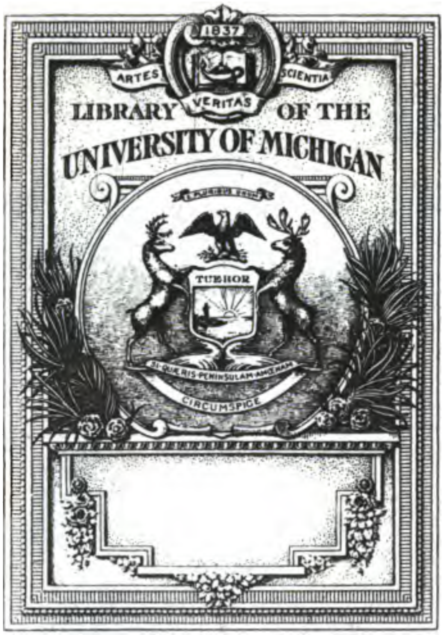

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1917

Air Pressure Tank Safety Orders

Issued by the
Industrial Accident Commission
of the
State of California

Effective January 1, 1917

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RARY

California
State Printing Office
Sacramento
1916

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INDUSTRIAL ACCIDENT COMMISSION
OF THE STATE OF CALIFORNIA

525 Market Street, San Francisco
423 Union League Building, Los Angeles

A. J. PILLSBURY,
WILL J. FRENCH,
MEYER LISSNER,
Commissioners.

JOHN R. BROWNELL,
Superintendent of Safety.

California. Industrial Accident Comm. 1-4-17

Reclass. 3-8-20 A.V.M.

SUMMARY OF THE SAFETY PROVISIONS

of the

Workmen's Compensation, Insurance and Safety Act.

Chapter 176 of the Laws of 1913.

Sections 51 to 72, inclusive, of the Workmen's Compensation, Insurance and Safety Act give the Industrial Accident Commission power to make and enforce safety orders, rules and regulations, to prescribe safety devices, and to fix safety standards. It also empowers the Commission to appoint advisors who shall, without compensation, assist the Commission in establishing standards of safety. The Commission may adopt and incorporate in its general orders such safety recommendations as it may receive from such advisors.

The Commission, carrying out its plan of obtaining the best practical ideas to incorporate in its Safety Orders, asked various interests to serve on subcommittees to draft Air Pressure Tank Safety Orders. These subcommittees were named after consultation with the General Safety Orders Committees, which were organized in San Francisco and Los Angeles, and which assisted the Commission in the preparation of General Safety Orders which went into effect January 1, 1916.

As with the General Safety Orders Committees, one subcommittee on Air Pressure Tank Safety Orders met in San Francisco, the other in Los Angeles.

San Francisco Subcommittee on Air Pressure Tank Safety Orders.

P. H. Reardon (chairman), president General Machinery and Supply Company, representing the California Employers' Federation.

John Traynor, Ocean Shore Iron Works, representing the California Employers' Federation.

J. B. Warner, Hartford Steam Boiler Inspection and Insurance Company, representing the Casualty Underwriters Association of California.

Herbert S. Snead, representing the Otis Elevator Company.

P. Flaherty, representing the International Association of Machinists.

F. E. Pearson, representing the Garage Owners Protective Association.

R. L. Hemingway, safety engineer, Industrial Accident Commission.

John R. Brownell (secretary), superintendent of safety, Industrial Accident Commission.

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Los Angeles Subcommittee on Air Pressure Tank Safety Orders.

T. J. Royer (chairman), chief engineer, R. A. Rowen Company, representing the National Association of Stationary Engineers No. 2.

W. B. Eichbaum, Baker Iron Works, representing the Merchants and Manufacturers Association.

C. H. Gray, inspector Maryland Casualty Company, representing the Casualty Underwriters Association of Southern California.

R. W. Stewart, engineer city engineer's office, representing the Board of Public Works.

A. Wade, safety inspector, Industrial Accident Commission.

H. L. Boyd (secretary), safety engineer, Industrial Accident Commission.

AIR PRESSURE TANK SAFETY ORDERS.

Order 900.

(*a*) Whoever owns, uses or causes to be used, any air pressure tank which carries twenty-five (25) pounds or over pressure per square inch, shall report the location of the same to the Industrial Accident Commission within ninety (90) days after these Orders become effective, except as exempted in Order 902 (*b*–1), (*b*–2), (*b*–3).

Order 901.

(*a*) No person shall install or use or cause to be used, any air pressure tank with a pressure exceeding twenty-five (25) pounds per square inch, unless the owner or user thereof shall hold a certificate of inspection issued by the Industrial Accident Commission, or by an inspector of boilers holding a certificate of competency, or a deputy inspector's permit from the Industrial Accident Commission of the State of California.

Order 902.

(*a*) Every air pressure tank carrying twenty-five (25) pounds or over pressure per square inch, shall be inspected internally and externally not less than once every two (2) years. A certificate of inspection shall be issued on the form prescribed by the Industrial Accident Commission if said tank be found to conform to these Orders.

(*b*) The following air pressure tanks are exempted from inspection:

1. Air pressure tanks under the jurisdiction of the federal government.
2. Air pressure tanks on street or railroad cars, motor vehicles, locomotives and cars under the jurisdiction of the Interstate Commerce Commission.
3. Air pressure tanks used exclusively for agricultural purposes.

Order 903.

(*a*) A copy of all inspection reports shall be forwarded to the Industrial Accident Commission within twenty-one (21) days after the inspection has been made, on forms provided. Such reports shall set forth any changes or additions necessary for the issuance of a certificate of inspection.

(*b*) Insurance companies whose inspectors hold certificates of competency as boiler inspectors or who hold deputy inspector's permits, shall report to the Industrial Accident Commission the name of the owner or operator and location of every air pressure tank on which insurance has been refused, cancelled or discontinued, giving the reasons therefor.

(*c*) Upon request of the Industrial Accident Commission or of an inspector of boilers holding a certificate of competency, or a deputy inspector's permit from the Industrial Accident Commission, the owner or operator of any air pressure tank operated at over twenty-five (25) pounds per square inch pressure shall prepare the said tank for inspection. The application of a hydrostatic pressure test shall lie in the discretion of the inspector, and if so ordered the owner or user shall make the necessary preparations for such test by blanking off connections and filling said tank with water.

(*d*) In no case shall a hydrostatic test exceed one and one-half (1½) times the maximum safe working pressure.

Order 904.

(*a*) The safe working pressure on an air pressure tank shall be determined by the rules laid down in paragraph 378 of the American Society of Mechanical Engineers Boiler Code.

(*b*) The lowest factor of safety used shall be five (5) for air pressure tanks not over ten (10) years old, which are constructed of plates less than one-quarter (¼) inch in thickness. For each five (5) years thereafter, the factor of safety shall be increased by one-half (½) point.

(*c*) Factors of safety for shell plates of one-quarter (¼) inch or over shall be

4 for tanks not over five (5) years old,
4¼ for tanks over five (5) and not over ten (10) years old,
4½ for tanks over ten (10) and not over fifteen (15) years old,
5 for tanks over fifteen (15) and not over twenty (20) years old.

For each five (5) years thereafter the factor of safety shall be increased by a further one-half (½) point.

(*d*) In case of unknown age of an air pressure tank, the minimum factor of safety shall be five (5).

(*e*) The ultimate tensile strength of a longitudinal joint which has been properly welded shall be taken as 28,500 pounds per square inch.

(*f*) Air pressure tanks with brazed joints will not be allowed.

(*g*) When old boilers or old boiler drums are used as air pressure tanks, the following rules shall be used in computing the safe working pressure on stayed or unstayed heads:

1. For unstayed flat heads of tanks over twenty (20) inches in diameter:

   Safe working pressure $= \dfrac{t \times ts \times 10}{a \times 8}$ (which is a factor of safety)

   Where t = Thickness of head in inches.
   ts = Tensile strength of material in lbs. per sq. inch.
   10 = A constant.
   a = Area of head to be stayed, in sq. inches.

2. For unstayed flat heads of tanks twenty (20) inches or less in diameter:

   Safe working pressure $= \dfrac{ct^2}{a}$

   Where c = 112 for heads less than 7/16 in. thick.
   c = 120 for heads over 7/16 in. thick.
   t = Thickness of head in sixteenths of an inch.
   a = ½ area of head in sq. inches.

3. For bumped heads concave to pressure:

   Safe working pressure $= \dfrac{t \times ts}{r \times 5}$ (which is a factor of safety)

   Where t = Thickness of head in inches.
   ts = Tensile strength of material.
   r = ½ radius to which the head is bumped, in inches.

4. For bumped heads convex to pressure:

   Safe working pressure $= \dfrac{t \times ts \times 0.6}{r \times 5}$ (which is a factor of safety)

   Where t = Thickness of head in inches.
   ts = Tensile strength of material.
   r = ½ radius to which the head is bumped, in inches.

5. For stays on flat heads the maximum allowable stress per sq. inch of net cross-sectional area shall not exceed the values given in the following table:

Material and type	Size up to and including 1¼" diameter or equivalent area	Size over 1¼" diameter or equivalent area
Weldless mild steel head to head or through stays	8,000 lbs.	9,000 lbs.
Weldless mild steel diagonal or crow-foot stays	7,500 lbs.	8,000 lbs.
Weldless wrought-iron head to head or through stays.	7,000 lbs.	7,500 lbs.
Weldless wrought-iron diagonal or crow-foot stays	6,500 lbs.	7,000 lbs.
Welded mild steel or wrought-iron stays	6,000 lbs.	6,000 lbs.
Mild steel or wrought-iron stay bolts	6,500 lbs.	7,000 lbs.

Order 905.

(*a*) Every air compressor system shall have one (1) or more safety valves of the direct spring loaded type installed on the delivery line.

Gaylord Bros.
Makers
Syracuse, N. Y.
PAT. JAN. 21, 1908

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